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## THE FEDERATED INSTITUTION OF MINING ENGINEERS.

### MEETING IN NORTH STAFFORDSHIRE.

(Continued from page 1169).

#### The Use of Steel Girders in Mines.

A paper on this subject Mr. E. THOMPSON said the substitution of iron or steel for timber is a matter that has for a long time engaged the consideration of scientific and business men, and so great has been the success attending the general substitution of the one for the other that it has become one of the leading considerations in the commercial world how iron or steel can still further be adopted where timber, stone, or brickwork is now used. Although the conditions of the use of girders in mines differ very considerably from their use in building construction, yet the various properties of steel, its strength and durability, enable a girder to show equally satisfactory comparative results when used there for supporting the roof as when used for any other purposes. As an instance of the difference in the working conditions to be met with in a mine, it may be mentioned that the weight to be supported in some places is not only unknown, but is practically irresistible, and the strain is further complicated by pressures both from the top and the sides. Instead of being regular and uniform, the load is varied, and in cases increases with sudden and tremendous force. In addition to these strains, earth movements occur, which tend to displace the supports of the beam, and to allow the framework to collapse. Heavy falls of roof also occur on the breaking of the beam, involving heavy costs in clearing away, and by the inconvenience of the delay caused by the obstruction. In such cases the strength, durability, and ductility of a steel girder, as compared with timber, are seen to great advantage. In the mine where girders were placed here and there amongst timber bars the latter have been broken while the girders remain uninjured. If not too much bent, girders can be reset, crown upwards, or can be straightened for meeting, at a moderate cost, and are but slightly impaired by the process. The relative costs are easily ascertained at any time, being dependent upon the fluctuations of the steel and timber markets. At the present time, estimating the girders at 25 per ton, these sections cost respectively 9d., 1s., and 1s. 1d. per foot. Comparing these prices with best larch timber, the cost of girders is very little in excess of timber, and if the cost of cutting and trimming the timber be included, with an allowance for waste, steel girders will probably be found to cost less per foot, and, in addition, prove much stronger. Steel girders are also more easily handled, and cost less to set in position. The methods adopted in the setting of steel girders are similar to those employed in setting timber bars. The most general modes are to insert the ends of the girder into holes cut in the sides of road, or to support them on walls or wood props. Where side pressure has to be met, girders resting on wood props must be wedged at the joint, to prevent the props from being displaced. Another method is to form a shoulder on the girder to form a support for the head of the prop. It is very important to keep the girders upright; where allowed to cant over their utility is considerably lessened. He concluded by making various suggestions as to the best mode of fixing girders.

Mr. E. B. WAIN said that he thought Mr. Thompson had made out a strong case in favour of a more general use of steel girders underground. He believed that they would be more largely used in the future, now that the girders could be bought at a cost only slightly more than that of good larch bars. For main roads where there was no active movement in the roof or sides, the advantages of steel over timber bars were evident, but he must confess that he had some doubt whether it would be advisable to use the girders in a newly-packed gate-road, and especially in inclined seams such as those worked in that district, where, in addition to the sinking of the roof, there was also more or less side-thrust on the higher side of the level roads. Whatever supports were used under such conditions were liable to be disturbed and damaged, for the force was, as the author had remarked, "practically irresistible," and he did not think it was good policy to put too substantial supports in a newly-made gob-road. The roof must sink, and although it is often necessary to put in some sort of bars, they should, as far as possible, be fixed so that they would not offer such resistance to the sinking, as would prevent the mass coming down evenly and regularly, or they would cause fracture. He thought, too, that in many cases it would not be good policy to use girders as props in the working face. Unless very great care was taken in setting them with a substantial wood lid at each end, there would be great difficulty in cutting them out in the wastes. In these two positions, as bars in newly-made packed roads, or as props in the working face, he should hesitate to use girders in the place of timber, but for main-road work and general repairs he was satisfied that there were all the advantages in the use of steel bars which were claimed for them by the author. Even if the bars could not be reset when damaged or bent, he thought that their value as scrap would more than cover the difference in cost between the steel and larch bars. He had recently done some repairs in a road 10 feet wide, which was lined with steel girders 22 lbs. per foot over five years ago. The roof was very wet and the ground was the heaviest he had to deal with, but although the girders had been severely punished and were twisted badly, he found there was little difficulty or cost in straightening them, and they had been reset in the same length of road. Larch timber 12 inches diameter in a similar position had been renewed three or four times since the girders were set, so it was

not difficult to make comparisons in favour of the steel bars. One of the objections to the use of girders had been that it was sometimes difficult to prevent them reeling and to attach them firmly to the props at the ends, but the appliances which had been described in the paper appeared to meet the difficulty if they did not add unduly to the cost of the setting. He had not found any difficulty from the bars reeling where care was taken to fix two or three light stretcher pieces between the bars and where the covering was done properly. In starting a new length of road, it might be found useful to couple the first two or three bars together with light screw or cotter pins passed through holes in the web of the girder, to prevent them being reeled by a sudden blow; but after the first few bars were set there should be no difficulty. If, however, the makers would put on the market girders with broader flanges than those mentioned in the paper, there would be less fear of canting; and there was no doubt, as there was a greater demand for this class of work, more suitable sections would be rolled. As it was, he could not find in any dealer's list girders with flanges equal to the depth, which appeared to be the most suitable section for pit bars. In conclusion, he should like to put on record some compression tests of props he, with other members, saw made by Professor Goodman on the occasion of the visit of the institute to the Yorkshire College last year. They were as follows:—Norway prop, 6 feet long, girth 1 foot 7½ inches, broke under load of 90·8 tons; Norway prop, 7 feet long, girth 1 foot 11 inches, broke under load of 50 tons; steel girder, 6 feet long, 5 by 4 by 50 lb. per yard, 5 sq. in. section, bent 5½ inches under load of 81·05 tons; steel girder, 6 feet long, 5 by 4 by 50 lbs. per yard, 5 sq. in. section, bent at 98·8 tons, and continued to bend at 40 tons. In each case care was taken to keep the props exactly vertical—i.e., in the direct line of the pressure. The props were splintered to matchwood at the pressure given above, but the girders showed no sign of fracture.

Mr. J. J. PEARCE said the use of steel girders or joists of H section underground in place of timber was a question that had been discussed on more than one occasion in papers brought before the notice of institutes connected with this federation, but he did not think, generally speaking, the economy of steel joists, for bars more particularly, in place of timber, had been fully realised by colliery managers, and for that reason he thought Mr. Thompson's paper was particularly opportune at this moment when the coal trade was in such a depressed condition, and it was so difficult to find opportunities for reducing the working charges. More especially was this the case in a district like North Staffordshire, where the coal measures consisted of an abnormal thickness of soft shales and marls, without any intervening beds of strong sandstones to hold off the superincumbent pressure. It would be recognised that the cost of timber was an unusually heavy item. During the six months ending June 30 he found that the consumption of steel joists at the collieries belonging to the Shelton Iron, Steel, and Coal Company (Limited) had amounted to over 250 tons, or at the rate of 500 tons per annum, and these had been used for supporting the roof and keeping down the floor in situations where timber or brickwork was of no use whatever. They had used them principally in the upper and middle coal measures under conditions that had tested their efficiency and economy in moving ground in a marked degree. As Mr. Thompson had pointed out, steel girders, costing 25 per ton, are equivalent to larch at 1s. 6d. per foot, the breaking strain of the former being practically twice as great as the latter; but when the cost of renewing larch, both for material and labour, was taken into consideration, the balance was greatly in favour of steel under any circumstances, but more particularly was this so in the case of haulage roads and return air courses that were perpetually on the move. So far, his practice had been to line all haulage roads and return air courses with steel bars, as circumstances required; they have not put them into the face for a variety of reasons, but have limited their use to permanent roads.

Mr. MERRIVALE said he was quite in accord with what had been said by previous speakers, but did not quite agree with them as to the first cost. He thought the cost of steel as compared with the timber used in the North of England was much heavier. Why should they use larch at 1s. 6d. when they could get Norway for 6d. or 7d.? The great advantage of steel was not in the fact that the cost in the first instance was not very high, but in the durability. On this point of durability he thought they required further information.

Mr. STOKES asked if they were to expect another paper from Mr. Thompson on the use of steel props in mines, which were now largely taking the place of wood.

Mr. THOMPSON agreed that steel props were being extensively used, and said he was willing to supply information concerning them at a future meeting.

Mr. STOKES said there appeared to be a greater opening for steel props than for girders. The only objection he found to them in the Midland district was their weight and difficulty of withdrawal. He believed that old steel rails were being extensively and successfully used as props.

The discussion was then adjourned, a hearty vote of thanks being given to Mr. Thompson, on the motion of the CHAIRMAN.

#### The Change of Composition Produced in Air by Flames and by Respiration.

A paper on this subject, read at a previous meeting by Professor Frank Clowes, of Nottingham, was briefly discussed. Mr. STOKES said there was one sentence in Professor Clowes's paper which he trusted would be taken with caution by those who read it. It was this—"The extinction of a flame of a candle or of a safety-lamp in air does not prove such air to be unfit for respiration." He (Mr. Stokes) thought himself that wherever the flame of a candle would not burn owing to noxious gases, such atmosphere should be unfit for respiration. Probably Pro-

fessor Clowes did not mean it in the way he (Mr. Stokes) had taken it, as unfit for respiration, but that it was not absolutely dangerous to life. He thought any atmosphere in which a candle would not burn was unfit for respiration. He had recently had to investigate the case of two men who lost their lives in an atmosphere in which a candle would not burn. With respect to the experiments, he took a little exception to the way in which those experiments were made. He should like Professor Clowes to have had the experiments repeated with the electric light, or whatever light was used, in the jar.

Professor MERRIVALE agreed with the last speaker that attention should be drawn to that paragraph, but they must not forget that the tests with the candle were for two purposes. They knew that if they wanted to live they could not do so with safety if the air was vitiated. What they required was a more delicate test. He thought the gas flame was a flame which might be used. If the gas flame went out men could not live. If the gas flame would burn men could live. Probably that was what Professor Clowes had in mind when he wrote the paragraph referred to by Mr. Stokes.

Professor CLOWES, in reply, said it was quite wrong to state that if a candle flame would not burn one must not go into such an atmosphere. He based that statement upon his own experiments. But Dr. Haldane had breathed air in which a candle had been extinguished without inconvenience or without any harm whatever. He should hesitate to go and preach to working colliers that they should be careless, but he did not think he need hesitate to bring a statement of that kind before a society like that. With respect to the criticism as to the method of experiment, the experiment was not made by simply holding a flame at the top of the jar in which the flame experiment was being made, but the flame was lowered to the depth of a fourth or a fifth of the jar. He had repeated the experiment by a second method which fully confirmed the first, although it was different in procedure, and he had no doubt of the close correctness of those results. Every precaution was taken against the mixture which had been prepared for the experiments being different.

On the motion of Professor MERRIVALE, votes of thanks were accorded to the North Staffordshire Institute and to Colonel Strick and the officers of the Staffordshire Artillery for the use of the room.

Colonel STRICK acknowledged the vote.

Mr. MAKEPEACE proposed a vote of thanks to the President for his able conduct in the chair.

This was seconded by Mr. T. E. STORRY and carried.

On leaving the hall the members were divided into two parties—one visiting the Electricity Works at Hanley, where they were received by Mr. E. J. Hammersley, the Mayor, and Mr. Lobley, the borough engineer; and another party going for a drive through Trentham Park.

#### The Annual Dinner.

In the evening the members dined together at the North Stafford Hotel, Stoke, Mr. E. B. WAIN, President of the North Staffordshire Institute of Mining Engineers, occupying the chair. The company, which numbered about 100, included, besides most of those attending the annual meeting, Mr. Woodall, M.P., Alderman E. J. Hammersley (Mayor of Hanley), and Mr. J. Lobley (borough engineer of Hanley). Letters of apology were received from Messrs. James Heath, M.P., C. Bill, M.P., D. H. Coghill, M.P., Mr. L. K. Shobridge, Mr. G. Menzies, Mr. W. D. Phillips, Mr. Harold Wright, and others.

After the loyal toast, the CHAIRMAN proposed "The County and Borough Members," remarking that they did not yet know if the new Parliament was a good one or a bad one, but it had the merit of having enrolled upon its list of members two ex-Presidents of the North Staffordshire Institute of Mining Engineers. (Hear, hear.) It might be that the new Parliament would not attempt any fresh mining legislation, but that was doubtful, and while they had in the House two such able representatives as Mr. Woodall and Mr. James Heath they might be sure that their business ability and knowledge of mining matters would be devoted to the interests of colliery proprietors, colliery workmen, and mining engineers. (Applause.)

Mr. WOODALL, M.P., in responding, alluded to the possibility of Parliament having to address itself to further legislation with regard to the management of mines, and expressed his confidence that when the opinion of Parliament had taken form on the statute book their body would apply themselves to the due carrying-out of any such legislation. (Hear, hear.) The Chairman had told them that the new Parliament was as yet untried; he might have added that it was practically unpledged. Never was there a Government called into office with so free a hand as to the course it regarded as calculated to serve the best interests of the country, and however widely they, as active, public-spirited men, differed in their views, all would earnestly join in hoping that the new Government, with its strong majority, and with a term of office before it which was not likely to be a short one, would be able to do much for the furtherance of the best interests of the country and for the promotion of those practical ends which all had at heart. (Hear, hear.) He thought they might take it that the signs which seemed to have hovered about them for the last year were now developing in a fulness of promise that we were on the eve of better trade. (Applause.) Those who had consulted the Board of Trade returns for the past month would be gratified by many of the signs there given; for example, in the increase of the value of imports by something near three millions, a large proportion being in raw materials to be employed in our manufactures. Exports for August also showed an increase over the corresponding period of last year of something like £1,900,000, and there were evidences, although the figures were not large, of an improvement and a hopeful sort of picking-up with regard to the iron and steel trade. (Hear, hear.) There was, further, an astounding and almost incredible increase in the exportation of machinery for mining purposes, amounting to 82 per cent., and to show



that the increase was a continuous one, during the eight months of the present year there had been an increase as compared with the previous year of not less than 64 per cent. They were familiar with the extraordinary development in Continental countries of mining operations, and of the mechanical and engineering facilities which had gone ahead to such a surprising extent within comparatively recent times, and it was impossible for them to be indifferent to the severity of the problem of Continental competition. It was, therefore, a happy thought which prompted a joint committee of employers and workmen from the southern part of the county to send a sort of mission to Belgium and Germany to enquire and report as to the causes which enabled these foreign competitors to send so largely into this country as they had done their productions of girder iron. We had yet to wait for the precise letter of their report, but there had been allowed to leak out some indications of the conclusions at which the deputation had arrived, and he supposed it might be taken as authoritative that they had come to the conclusion that although low rates of wages and longer hours were undoubtedly factors which no sensible man could overlook, these were only elements in the question and not determining considerations. This, he was bound to say, coincided with and confirmed the views expressed by his colleagues in the Royal Commission on Technical Instruction, and pointed out the enormous advantage which these rival countries had by their scientific attainments and their study of the technique of business in competing with us. He hoped that this conclusion would be accepted by such a practical body as that institute, and that the weight of their authority would be given in encouragement of a closer study of technical points bearing upon their important industry, and that the movement which had had such an extraordinary impulse in recent years would be guided into safe and practical lines, calculated to produce great benefits for the business in which they were concerned. (Hear, hear.) It would, however, be a short-sighted policy if they ignored the relationship which coal mining bore to other manufactures and enterprises of the country. It was impossible for them to prosper unless there was a wholesome state of activity in regard to the other manufacturing enterprises of the country, and that consideration ought never to be lost sight of by those interested on behalf of the capitalists and those who were the advisers of the working class engaged in the colliery business. Both would be culpable if they overlooked the co-relationship between one great interest and all other manufacturing enterprises of the country which were so much dependent upon the fuel which they had to produce. (Hear, hear.) Having referred to the ingenuity which was being concentrated with the view of reducing this dependence upon coal as a fuel, Mr. Woodall adverted to agriculture, and said that Parliament was deeply pledged to do something for that industry. Agriculturists, he thought, would do well to place little reliance upon Parliament, and very much upon themselves, and they might hope that the large powers which had been given to the residents of the country districts, and the large sums placed at their disposal for technical education, would enable them at any rate to wipe away the reproach—strong freetrader as he was, he thought it a reproach—that we were dependent upon other countries not much more favoured than our own for butter, dairy produce, and poultry. Whether this could be effected by the provision of light railways or the regulation in a more equitable sense of the burden of taxation, he honestly believed that they might rely that there would be no difference in effect among the members of the present Parliament. Reverting to the regulation of mines, he said that very much had been undertaken by one Government and carried out by another for improving the conditions under which workmen had to carry on their avocation, and there was no factor more important in the conduct of a great industrial community than that of ensuring the cordial co-operation of the workmen engaged. How glad they ought to be, then, that there was a sign of a return to sounder economic views with regard to the relationships of capital and labour, of which he saw some gratifying indication in the proceedings of the late Trades Union Congress. He trusted that they might look forward not only to a time of increasing prosperity, but also to a time when industries would be carried on with the harmonious, intelligent, and happy relationship of those engaged therein. (Applause.)

Professor MERRIVALE proposed "The Federated Institute of Mining Engineers." He spoke in favour of the educational work of the institute being extended, and said that high as was their standard of original papers, he hoped to see it still improved. If those in the scientific world had anything to bring forward in relation to mining, their institution would gladly give the opportunity. He wished the institute could devise methods of carrying on the mining business without destroying the face of Nature. (Hear, hear.)

The PRESIDENT (Mr. G. A. Mitchell), in reply, said they were met on one common ground with one end in view—the scientific development of the mineral resources of this country. They realised that while they had something to teach they had a great deal more to learn.

Mr. W. N. ATKINSON gave "The Coal, Iron, and Steel Trades of North Staffordshire." He said he hoped and believed that they were now emerging from a long period of depression from which they had suffered. Judging from the reports, there were undoubted signs that better times were in store. He directed attention to the importance of technical education as bearing upon the prosperity of the coal and iron trade, and suggested that it was worth consideration whether more facilities for this instruction could not be provided in the district, instead of having to rely upon Manchester and Birmingham. (Hear, hear.)

Mr. H. M. LYNAM acknowledged the toast, and congratulated the company on the fact that they seemed to be getting out of what appeared to be a bottomless pit of depression. They were finding, too, that the long lane of low prices at last showed some sign of a turning. During the last five years the price of ordinary bar iron had fallen by upwards of £4 per ton, which was nearly 50 per cent. of its then value, while it had been most difficult to reduce the cost of production on account of raw materials and wages remaining at a standstill. Seeing the great strain this had put on the manufacturers, it must be some satisfaction to know that North Staffordshire had met it as well as it had. The report referred to by Mr. Woodall had created quite a scare in the minds of many people. Instead of the accepted theory that lower wages enabled the foreigner to produce at a cheaper rate than we, it now appeared to be the effect of more technical education, better work, and superior plant and machinery. He would ask them to take the report as it had come out *cum grano salis*. (Hear, hear.) This country had applied itself to technical study, and large expense had been incurred in the improvement of plant. He believed there were works in this country and in Scotland equal to any of those abroad.

Mr. DE RANCE gave "Her Majesty's Inspectors of Mines," Mr. J. L. HEDLEY, Inspector for Northumberland, responding.

Mr. R. H. COLE proposed "The Visitors," Mr. T. A. SOTHERN and the Mayor of HANLEY replying. The latter alluded to the Diglake disaster, and the noble response which had been made to the appeal for support to the "ereared, observing that he hoped by their conferences and the mutual information they

were able to afford, such a disaster would never occur again. The health of the Chairman and secretary (Mr. J. R. Haines) was also pledged, and the proceedings were of a pleasant and successful character.

## THURSDAY.

Messrs. Doulton and Co.'s Works and Messrs. Jas. Macintyre and Co.'s Washington Works, Burslem.

On this day the members assembled at Stoke and proceeded to Burslem to inspect the processes of making china and earthenware. At Messrs. Doulton's the members were received by Mr. J. C. Bailey, and were conducted to the clay sheds to witness the various mixing processes, the removal of impurities, and the preparation of clay for the potter. They next went to the different workshops to see the manipulation of the clay, the glazing, drying, and placing the ware in the ovens. They also had an opportunity of seeing the decorating department, and lastly the showrooms, which rank amongst the finest in the Potteries. At Messrs. Macintyre's the visitors were received by Mr. Woodall, M.P., and Mr. Henry Watkin, managing director. Here they also had an opportunity of witnessing the various processes of potting applied to the beautiful articles for which the establishment is famous.

## The Sneyd Colliery and Brickworks.

The members also visited the Sneyd Colliery and Brickworks, where they were received by Mr. W. Heath, Mr. John Heath and Mr. Frost. The No. 1 or upcast shaft is 12 feet in diameter and 1836 feet deep to the return air-cuts. The No. 2 or downcast or winding shaft is sunk to the depth of 1864 feet to the insets, whence cruts pass east and west to six coal seams—the Mossfield, Yard, and Main coal seams on the west, and the Bowling-alley, Holley-lane, and Hard Mine coal seams to the east. The Holley-lane and Yard coal seams, each 3 feet thick, are worked by the spunney system. The No. 3 downcast and winding shaft is 1140 feet deep, and communicates with the Burnwood, Mossfield, Two-feet, and Seven-feet coal seams. The No. 2 winding-engine has two horizontal cylinders, each 38 inches in diameter and 6 feet stroke, fitted with Melling steam reversing gear and Woodworth automatic progressive cut-off gearing. The cylindrical drums are 21 feet in diameter and 7½ feet wide. The engine is capable of raising 1200 tons from the depth of 1864 feet in eight hours. The No. 3 winding-engine has two horizontal cylinders, each 16 inches in diameter by 4 feet stroke, and is capable of raising 800 tons in eight hours from the depth of 1140 feet, owing to the use of the Koepe system of winding. Locked lamps of Mueseler type (bonneted) are used, adapted to burn petroleum by the Heath and Frost petroleum burner for safety-lamps, the cost being only about half that of prepared colza oil, and the light much better. About 1200 lamps are in use at the colliery. Tonite is the explosive used, surrounded by a gelatinous cartridge, the contents of which are liquefied by the explosion, thus destroying any flame or fumes that might otherwise arise. The shots are lighted by a Heath and Frost shot-firing lamp, by which the fuse is ignited in a completely closed chamber. Four shaker-screens of the bar type are in operation at the truck sidings, and a picking-band, by which the coal is carefully sorted. Heath and Woodworth's through-way end-tippers are used; these, with the elevator, screens, and picking-bands, are driven by a horizontal engine with two cylinders, each 8 inches in diameter. Steam is generated in six Lancashire boilers, each 30 feet long and 7 feet in diameter, and two elephant boilers, all worked at a pressure of 90 lbs. per square inch. There are three underground hauling engines driven by steam generated in underground boilers. These furnaces and the exhaust steam of the underground engines produces a ventilating current of 100,000 cubic feet of air per minute, under a depression of 1¼ inch of water in No. 2 pit, and of 68,000 cubic feet of air per minute under a depression of 1 inch of water in No. 3 pit. The surface haulage, on an incline 1800 feet long, is worked by means of an electric motor of three horse-power, and nine coal tippers at the land sale wharf by another motor of one horse-power. The electric plant includes two dynamos of 15½ kilowatts each, driven by two horizontal engines. There are four dip pumps and one shaft pump. The latter pump, placed at the bottom of the No. 3 shaft, has a steam cylinder 26 inches in diameter by 4 feet stroke, and works a double-acting ram pump 7 inches in diameter. These pumps and the water tanks control the whole of the water.

## Luncheon.

In the afternoon the visitors were entertained at luncheon in the Town Hall, Burslem, by Messrs. James Macintyre and Co. and the Sneyd Colliery and Brickworks Company, about 70 being present.—Mr. W. WOODALL, M.P., presided, and was supported by Messrs. S. Lawton (Mayor of Burslem), W. N. Atkinson, John Heath, E. B. Wain, G. A. Mitchell, J. R. Haines, C. M. Percy (Wigan), and W. Heath. The vice-chairs were occupied by Mr. T. Robinson and Mr. Arthur Dean, directors of the Sneyd Colliery.

After the loyal toasts, Mr. E. B. WAIN briefly proposed "The Visitors," for whom Mr. MITCHELL, in appropriate terms, responded.

Mr. PERCY proposed the toast of "The Hosts." He said he was happy to be present, because he was to some extent identified with improvements that were being made at the Sneyd Colliery. The proprietors of that colliery had realised that improvements might be made in connection with colliery appliances, and they had the courage to go to some expense in the matter. They saw that whilst on board ship something like 2 lbs. per horse power was sufficient, the consumption in pit winding was something like 10 lbs. of fuel per horse power. They were striving to effect economy in connection with colliery machinery. These appliances they were introducing by arrangements with Mr. Benjamin Woodworth and Messrs. Cowlishaw and Co., who lived in their own district. He expressed his belief that what was being done at the Sneyd Colliery would be followed by many collieries in the United Kingdom. (Applause.)

Mr. WILLIAM HEATH responded in a neat speech, expressing his regret that owing to the changes taking place the colliery works were not in such good order as it was expected they would be in shortly.

The Mayor of BURSLEM, in highly complimentary terms, proposed the health of the Chairman, a toast which was very heartily received.

The CHAIRMAN, in responding, said he was glad that the institute had been able to pay a visit to the mother town of the Potteries. Referring to a speech made the previous night, he said he scarcely thought it was for people whose business was connected with the getting of coal to reproach them for smoky atmospheres, but they were endeavouring to do all they could to improve the condition under which the fuel was consumed. In that district they had mastered some of the difficulties which they had thought to be invincible under industrial conditions like those which prevailed in the Potteries. He should have liked the visitors to have seen the beautiful park which had been created as if by the magic wand of the enchanter out of a dreary waste as it was left by the colliers. They had shown the possibility of cultivating the most refined conditions in art, in music, and in those social qualities which went to elevate the life of the humblest worker, and their chief regret was that the visit was so much of an evanescent and flying character that they were not able to see as much as they would have liked to

show, and which would have enabled them to carry away a better opinion of the Staffordshire Potteries.

This concluded the toast list.

## REPORTS FROM THE MINES.

ANGLO-MEXICAN.—The manager, writing from the mine under date August 20, reports as follows:—New Main Tunnel. Good progress continues to be made in this tunnel, the face having been advanced 23 feet during the past week, making a total length to date of 1779 feet.—Upraise No. 12, No. 2 level. This upraise was advanced 8 feet during the week under report, making a total to date of 70 feet. The ore in the face of this upraise has improved somewhat since last week, a sample from same assaying \$100 per ton, which, however, I think is a little higher than the average value of the ore.—Upraise No. 11, No. 2 level. Work in this upraise was advanced 6 feet during the past week, making a total height to date of 123 feet. The vein in the face of the drift continues about 2 feet in width, and carries ore assaying about \$23 per ton in gold, the ore in the upraise having kept steadily at about this very same grade for the past three or four weeks.—Main drift north, No. 3 level. Work in this drift was advanced 4 feet during the week under report, making a total length to date of 14 feet. The ore in the face of the drift is of good width, and carries ore assaying about \$120 per ton in gold, the grade having improved somewhat over last week.—Stopes. There is no change to report in the appearance of the stopes, and they continue to supply us with all the ore required for the mill.

BAILEY'S REWARD.—Mining report, dated Coolgardie, W.A., August 10: For the week ending 9th inst., work done is as follows:—380 feet level. Driven 10 feet, total 135 feet. The hanging-wall is running its regular course, with a vein of schist heavily mineralised on the footwall side, but carrying no gold. During the week the small vein of quartz mentioned in last week's report widened out to 6 inches, but disappeared afterwards. No quartz visible in face at all now.—Gordon shaft, 50 feet level. South drive extended 2 feet for week, working only one shift, total 200 feet, leaving about 18 or 20 feet more to drive before connecting with Greene shaft. The face is much improved, and widened out to 2 feet. Gold seen in stone in breaking.—Keating shaft. South drive driven 9 feet, making a total of 22 feet from shaft. Face not looking quite so well, reef being much broken and thrown about, and having run rather smaller. About 3 feet wide. No gold visible.—General. With the exception of these drives no other work is being continued this fortnight in the Reward Lease. All the available spare underground men employed in the sinking and timbering of the tallings pit at the battery. We hope to have them finished during the beginning of next fortnight and all other work in connection with them, and shall make a start as soon as possible. The full complement of eight men are at work on the Reward air shaft, north and south stopes. Both these stopes are looking well. The usual quantity of stone is being broken and hauled to the surface ready for trucking to the battery when started.—Oil engine. This engine will be ready for a start this afternoon, and provided we are able to procure the necessary amount of fresh water for her cooling tanks; will give her a quiet run by herself for an hour or two, and I hope to give you the result before closing this letter.—(Signed) Tom Y. Browne.

BAILEY'S REWARD NO. 1 SOUTH.—Mining report, dated Coolgardie, W.A., August 22. The work done for the last week is as follows: 170 feet level. Driven 4 feet further north, making a total from shaft of 38 feet. The reef has slightly improved in width and appearance, and is now about 4 feet wide, with a few streaks of hornblende schist through the quartz in the face.—120 feet level. Winze sunk 3 feet during the past week, making a total depth of 10 feet. We continue to see fine gold during the breaking of the stone. A trial crushing of 10 tons of stone broken whilst sinking the winze returned in the battery 19 ounces, proving it to be of a good payable quality.—90 feet level. Winze sunk 8 feet, with a reef about 2 feet, very nice gold seen in stone in the last two days, and has every appearance of going down, total depth of winze 11 feet.—Battery. Hauled and trucked from dump 62 tons, all of which has gone through the battery. This week all the stone from sinking the winze at the 90 feet level will be included in the crushing, and should make a marked difference in the return for the fortnight.—(Signed) Tom Y. Browne.

BRITISH BROKEN HILL PROPRIETARY.—Mining manager's report for the week ending August 21.—Blackwood No. 1 shaft, 300 level. West crosscut off plat advanced 5 feet, total 13 feet from plat; Face in hard country rock.—200 level. North-east drive started down winze in No. 1 west crosscut was driven 23 feet. Face in fair grade sulphide ore. We mined 36 tons sulphide ore, assaying 23 per cent. lead, 15 ounces silver per ton, and 24 per cent. zinc. The west crosscut down winze in western extension, which has been turned off more to the left during the week, was extended 9 feet, and face is now entering sulphide ore of fair value. We broke 7 tons carbonate, assaying 18 per cent. lead and 14 ounces, and 4 tons sulphide, 24 per cent. lead, 15 ounces silver, and 30 per cent. zinc. The winze in long crosscut off western extension was sunk 6 feet, total depth 32 feet; bottom showing good grade sulphides. We broke 8 tons sulphides, assaying 21 per cent. lead, 15 ounces silver per ton, and 31 per cent. zinc.—Howell No. 2 shaft, 300 level. West crosscut from plat lengthened 8 feet, total 109 feet; country getting softer for driving, and carrying more sulphides. We hoisted 7 tons, averaging 9 per cent. lead, 18 ounces silver per ton, and 16 per cent. zinc.—270 level. 3 feet was driven on north side of east crosscut, making total length 39 feet. Have stopped work here and started a winze in this north drive, which has been sunk 19 feet through good sulphide ore. We mined 41 tons sulphides, averaging 37 per cent. lead, 15 ounces silver, and 17 per cent. zinc.—100 level. Have nearly finished strengthening and filling in old stopes around here.—Marsh No. 6 shaft, 2nd level. We mined 40 tons carbonate ore, averaging 21 per cent. lead, 41 ounces silver per ton from winze stopes.—Junction 300 level. Upraise is risen 4 feet, total height 33 feet. Have also been timbering and dividing off the uprise during the week.—One shipment. We dispatched and sold to Block 14 Mine 125 tons: net sulphide ore from main workings during the week, which contained 1258 ounces silver and 4½ tons lead. The following has been agreed from previous shipments forwarded to Block 14 Company. Part Adelaide—viz., 62 tons net first-class carbonates from Marsh No. 6 shaft, containing 2721 ounces silver and 1½ tons lead; also 534 tons net second-class carbonates, containing 1713 ounces silver and 7 tons lead. The week's assays vary: Carbonate, from 10 to 33.5 per cent. lead, 6.6 to 91.1 ounces silver per ton; sulphides, from 3 to 45 per cent. lead, 3.5 to 27 ounces silver per ton, and 12.2 to 35.9 per cent. zinc.

BRILLIANT BLOCK.—Mining manager's report for the fortnight ending August 7: Underlie shaft sunk 3 feet, total below No. 1 plat 106 feet. Formation 4 feet wide, with patches of quartz through it. 7 feet level east driven 21 feet, total length 235 feet from shaft. Reef in face 2 feet, 17 dwts.—Stopes. Reef 18 inches from shaft, 10 to 20 dwts.—6 level west. Reef in stopes over level and to 5 feet, 10 to 20 dwts.—4 level west. Reef in stopes over level and to 5 feet, 15 to 20 dwts.—4 level west. Two stopes near West Boundary reef 2 feet 6 inches, 12 dwts.—4 level east. Four stopes on flat reef under level 6 to 18 inches, 16 dwts.

CUMBERLAND GOLD.—Mining report for July: No. 5 level north. This level was driven during the month to a distance of 823 feet north of No. 2 shaft, at which point I ceased driving, the reef apparently pinching out and the level being too hot for the men to work in until a winze is sunk from No. 4 level. The face shows a few inches only of reef, with about 2 feet of formation, intersected with streaks of ore; the appearance is very unsettled at present. During the month I engaged men on an underhand stop with a view of discovering the character of the reef under foot. After raising about 3 tons the reef pinched out—in fact, the reef has been very badly all along this level, although the indications have pointed to the



probable proximity of an ore body. I am now crosscutting into the footwall about 30 feet from the end of the level. The country met with so far is very unsettled, with occasional streaks of ore running through the granite. The crosscut is now driven 13 feet. It is my intention to continue this crosscut further, but in the event of not meeting with favourable results, I will crosscut into the hanging wall.—No. 4 intermediate level. Four men have been engaged during the month rising from this level towards the point at which the rich reef was struck last year. They have stopped now about 20 feet to the north, and the reef is showing overhead for the entire distance, and apparently making due north perfectly flat.—Stops above No. 4 level north. Four men have been employed stopping above this level. The reef is still patchy, with bunches of really good ore. It is my intention to continue stopping up towards No. 3 level. During the month, after considerable labour and trouble, I managed to clear the old No. 1 North company's shaft, mentioned in my last report, without any accident. A quantity of timber and mullock which came down in clearing the shaft is now being removed from the bottom of the shaft. When this work is completed I intend stopping up from this point, as there is a reef on the footwall showing good looking ore, which is well worth following up.—Southern stopes. A party of men working on contract are raising ore at 20s. per ton from below No. 3 level south. I am glad to be able to report that the reef is improving in size and quality, at present showing 3 feet of ore.—Anthony Gallaghi's.

**CHAMPION REEF.**—Mine agent's report for fortnight ending September 9: Garland's shaft. This has been sunk 5 feet, total depth 663 feet 6 inches. Lode 2 feet, assaying 3 ounces 12 dwts. of gold per ton. The 840 feet level north has been driven 19 feet, total length 510 feet 9 inches. Lode 2 feet 6 inches, assaying 1 ounce 22 grains of gold per ton. No. 3 rise in back of level risen 18 feet, total height 71 feet 6 inches. Lode 2 feet 6 inches, assaying 1 ounce 5 dwts. 22 grains of gold per ton. No. 3 rise above the 840 feet level south risen 21 feet 6 inches, total height 101 feet 6 inches. Lode 3 feet, assaying 3 ounces 5 dwts. 8 grains of gold per ton. This is now communicated to the 740 feet south level. The 740 feet level north has been driven 22 feet, total length 718 feet 6 inches. Lode 1 foot 6 inches, assaying 1 ounce 4 dwts. 18 grains of gold per ton. No. 5 rise in back of level risen 18 feet, total height 33 feet. Lode 2 feet 6 inches, assaying 1 ounce 12 grains of gold per ton. The 630 feet level north has been driven 31 feet 3 inches, total height 855 feet 6 inches. Lode 4 feet 6 inches, assaying 1 ounce 18 grains of gold per ton. No. 6 rise in back of level risen 9 feet 6 inches, total height 66 feet. Lode 2 feet 6 inches, assaying 1 ounce 1 ounce of gold per ton.—Ribblesdale's shaft. The 640 feet level north has been driven 22 feet, total length 100 feet 6 inches. Lode 1 foot, assaying 15 dwts. 20 grains of gold per ton. The 640 feet level south has been driven 19 feet, total length 84 feet. Lode 1 foot, assaying 1 ounce 20 grains of gold per ton. The 540 feet level south of east crosscut, of 540 south of shaft, has been driven 27 feet 6 inches, total length 336 feet. Lode 2 feet, assaying 1 ounce 1 dwts. 18 grains of gold per ton. The winze below this level has been sunk 15 feet, total depth 124 feet 6 inches. The lode is 2 feet 6 inches wide, assaying 12 dwts. 12 grains of gold per ton. Rise in back of this level has been risen 12 feet 6 inches, total height 66 feet 6 inches. Lode 3 feet, assaying 1 ounce 5 dwts. 19 grains of gold per ton. Incline winze north of No. 1 west crosscut at 440 feet south of east crosscut, south of shaft, has been sunk 14 feet 6 inches, total depth 183 feet. Lode 3 feet, assaying 14 dwts. 12 grains of gold per ton.—Carmichael's shaft. The 540 feet level north has been driven 31 feet, total length north of east crosscut 97 feet. Lode 5 feet, assaying 1 ounce 14 dwts. 14 grains of gold per ton. Rise in back of level risen 7 feet 6 inches, total height 37 feet 6 inches. This is communicated to 440 north of incline winze (new rise). No. 2 in back of level has been risen 6 feet 9 inches, total height 6 feet 9 inches. Lode 2 feet 6 inches, assaying 1 ounce 5 dwts. 15 grains of gold per ton. The rise on the east part of lode 16 feet north of east crosscut. Incline winze below 440 north has been sunk 3 feet 9 inches, total depth 95 feet 6 inches. This is communicated to 540 north rise. Crosscut east of 440 north level has been driven 14 feet 9 inches, total length 14 feet 9 inches. This is to communicate with east part of lode as seen in the 540 feet level.—Rowe's shaft. This has been sunk 3 feet 6 inches, total depth below the 515 feet level 19 feet 6 inches. Lode 1 foot, assaying 1 ounce 1 dwts. 13 grains of gold per ton. The 515 feet level north has been driven 19 feet 9 inches, total length 81 feet. Lode 4 feet assaying 2 ounces 17 dwts. 22 grains of gold per ton. Winze below, the 415 feet level north has been sunk 9 feet, total depth 68 feet. Lode 2 feet, assaying 2 ounces 1 grain of gold per ton.—Stopes. Dalyell's shaft. Stope in back of 620 feet south of 530 feet south winze cut 8 fathoms 2 feet 9 inches. Lode 2 feet 6 inches, assaying 1 ounce 6 grains of gold per ton. Stope in back of 620 feet north of 530 feet south winze cut 8 fathoms 3 feet 9 inches. Lode 2 feet, assaying 1 ounce 12 grains of gold per ton. Stope in back of 620 south of 530 north winze cut 15 fathoms. Lode 3 feet, assaying 1 ounce of gold per ton. Stope below 440 feet south of north winze cut 12 fathoms 5 feet 9 inches. Lode 4 feet, assaying 1 ounce 11 dwts. 20 grains of gold per ton. Stope below 440 feet north of south winze cut 11 fathoms 4 feet. Lode 3 feet, assaying 1 ounce 2 dwts. 18 grains of gold per ton.—Garland's shaft. Stope in back of 840 feet north of No. 1 north rise cut 13 fathoms 1 foot 6 inches. Lode 4 feet 6 inches, assaying 1 ounce 9 dwts. 6 grains of gold per ton. Stope in back of 840 south of No. 1 rise cut 7 fathoms. Lode 3 feet, assaying 1 ounce 5 dwts. 8 grains of gold per ton. New stopes in back of 840 south of No. 2 north rise cut 4 fathoms 1 foot 3 inches. Lode 4 feet 6 inches, assaying 1 ounce 15 dwts. 8 grains of gold per ton. Stope in back of 840 north of No. 1 south cut 16 fathoms 4 feet 6 inches. No sample; suspended for a time. Stope in back of 840 south of No. 1 south rise cut 21 fathoms 1 foot 3 inches. Lode 3 feet, assaying 1 ounce 5 grains of gold per ton. Stope in back of 740 north of No. 2 north rise cut 10 fathoms 3 feet. No sample; suspended. Stope in back of 740 north of No. 3 north rise cut 11 fathoms 4 feet. Lode 4 feet, assaying 1 ounce 6 dwts. 16 grains of gold per ton. Stope in back of 740 south of shaft cut 16 fathoms 3 feet 9 inches. Lode 2 feet, assaying 1 ounce 16 dwts. of gold per ton. Stope below 630 feet south of 740 feet No. 1 north rise cut 15 fathoms 5 feet 6 inches. Lode 4 feet, assaying 1 ounce 8 dwts. 9 grains of gold per ton. Stope in back of 530 north of No. 7 north rise cut 3 fathoms 2 feet. Lode 4 feet, assaying 1 ounce 4 dwts. of gold per ton. Stope in back of 530 south of No. 7 north rise cut 4 fathoms 1 foot 3 inches. Lode 2 feet 6 inches, assaying 1 ounce 7 dwts. 12 grains of gold per ton. Stope in back of 530 feet south of No. 6 north rise cut 3 fathoms 5 feet. Lode 3 feet, assaying 19 dwts. 20 grains of gold per ton. Stope in back of 530 north of No. 2 north rise cut 6 fathoms 4 feet. Lode 5 feet, assaying 1 ounce 22 grains of gold per ton. Stope in back of 530 south of No. 2 north rise cut 12 fathoms. Lode 6 feet, assaying 18 dwts. 18 grains of gold per ton. New stopes in back of 440 north of No. 7 north rise cut 13 fathoms 1 foot. Lode 6 feet, assaying 13 dwts. 6 grains of gold per ton. New stopes in back of 440 south of No. 5 north rise cut 19 fathoms 3 feet. Lode 4 feet, assaying 1 ounce 19 dwts. 19 grains of gold per ton. Stope in back of 440 north of No. 2 north rise cut 6 fathoms 3 feet 6 inches. Lode 3 feet, assaying 1 ounce 14 dwts. 2 grains of gold per ton. Stope in the back of the 440 south of No. 2 north rise cut 7 fathoms 3 feet. Lode 6 feet, assaying 19 dwts. 20 grains of gold per ton. Stope in back of 440 north of rise south of west crosscut cut 5 fathoms 2 feet 3 inches. Lode 5 feet, assaying 1 ounce 9 dwts. 11 grains of gold per ton. New stopes below 440 south of winze at west crosscut cut 9 fathoms 6 inches. Lode 4 feet 6 inches, assaying 1 ounce 2 grains of gold per ton. Stope in back of 440 south of rise north of shaft 5 fathoms 2 feet. Lode 3 feet, assaying 19 dwts. 20 grains of gold per ton. Stope below 340 north of north winze cut 6 fathoms 1 foot. Lode 4 feet 6 inches, assaying 1 ounce 12 grains of gold per ton. Stope below 340 feet south of north winze cut 3 fathoms 2 feet 6 inches. Lode 3 feet, assaying 1 ounce 6 dwts. 12 grains of gold per ton. New stopes below 340 north of 440 feet No. 6 north rise cut 5 fathoms 6 inches. Lode 1 foot 6 inches, assaying 1 ounce 5 dwts. of gold per ton. Stope below 340 south of 440

No. 3 north rise cut 8 fathoms 1 foot 6 inches. Lode 3 feet 6 inches, 3 feet 6 inches, assaying 16 dwts. 20 grains of gold per ton. New stopes below 340 north of No. 2 north rise, cut 6 fathoms 3 feet 3 inches. Lode 4 feet, assaying 2 ounces 1 dwts. 10 grains of gold per ton. New stopes below 340 north of 440 rise south of west crosscut, cut 3 fathoms 5 feet. Lode 3 feet 6 inches, assaying 13 dwts. 1 grain of gold per ton. Stope in back of 240 north of No. 2 north rise, cut 11 fathoms 3 feet. Lode 3 feet 6 inches, assaying 2 ounces 2 dwts. 12 grains of gold per ton. New stopes in back of 240 north of No. 1 north rise cut 3 fathoms 0 feet 3 inches. Lode 2 feet, assaying 1 ounce 13 dwts. 13 grains of gold per ton. Stope below 240 south of winze at west crosscut cut 15 fathoms 2 feet 9 inches. Lode 4 feet, assaying 1 ounce 11 dwts. 18 grains of gold per ton.—Ribblesdale's shaft. Stope in back of 440 south of No. 2 west crosscut cut 9 fathoms 2 feet 6 inches. Lode 4 feet 6 inches, assaying 2 ounces 12 dwts. 20 grains of gold per ton. Stope in back of 440 south of No. 1 west crosscut cut 10 fathoms 6 inches. Lode 4 feet, assaying 1 ounce 11 dwts. 16 grains of gold per ton. Stope in back of 440 south of east crosscut south of shaft cut 5 fathoms 4 feet 9 inches. No sample; suspended. New stopes below north level from east crosscut at 340 south, cut 2 fathoms 4 feet 3 inches. Lode 2 feet, assaying 1 ounce 2 dwts. 22 grains of gold per ton. Stope in back of 340 south of No. 2 south rise, cut 10 fathoms 9 inches. Lode 4 feet 6 inches, assaying 1 ounce 11 dwts. 19 grains of gold per ton. New stopes in back of 340 south of No. 1 south rise, cut 4 fathoms 1 foot. Lode 3 feet, assaying 1 ounce 13 dwts. 14 grains of gold per ton. Stope on fold at 340 north, cut 5 fathoms 4 feet. Lode 4 feet 6 inches, assaying 1 ounce 4 dwts. 12 grains of gold per ton. No. 2 stopes north of No. 2 rise in back of 240 south, cut 11 fathoms 4 feet. Lode 4 feet, assaying 1 ounce 18 dwts. 20 grains of gold per ton. No. 3 stopes north of No. 2 rise in back of 240 south cut 8 fathoms 5 feet 9 inches. Lode 2 feet, assaying 1 ounce 9 dwts. 11 grains of gold per ton. No. 2 stopes south of No. 1 rise in back of 240 south cut 11 fathoms 5 feet. Lode 6 feet, assaying 1 ounce 9 dwts. 18 grains of gold per ton. Stope north of No. 1 rise in back of 240 south, cut 6 fathoms 4 feet 3 inches. Lode 3 feet, assaying 1 ounce 6 dwts. 18 grains of gold per ton. Stope on east part of lode in back of 240 south, cut 6 fathoms 3 feet 6 inches. Lode 2 feet 6 inches, assaying 1 ounce 17 dwts. of gold per ton.—Carmichael's shaft. New stopes below 225 feet north of north winze cut 2 fathoms 4 feet. Lode 4 feet 6 inches, assaying 1 ounce 6 dwts. 12 grains of gold per ton. New stopes below 225 south of north winze cut 2 fathoms 2 feet. Lode 4 feet, assaying 19 dwts. 23 grains of gold per ton.—Rowe's shaft. Stope in back of 315 north of south rise cut 5 fathoms 4 feet. Lode 4 feet 6 inches, assaying 18 dwts. 1 grain of gold per ton. Stope in back of 315 south of south rise cut 6 fathoms 4 feet 6 inches. Lode 4 feet 6 inches, assaying 18 dwts. of gold per ton. New stopes in back of 315 north of shaft cut 2 fathoms 2 feet. Lode 1 foot 6 inches, assaying 18 dwts. 20 grains of gold per ton. The above stopes is for August.

**COROMANDEL.**—Superintendent's report for fortnight ending September 9. Prospect shaft. Crosscut east from south. The trial drift north from this crosscut has been advanced a further 6 feet, and suspended. The branch of quartz followed had never assayed more than 2 or 3 dwts., and in the present end it has almost disappeared. This machine has been placed to continue the drainage of the crosscut east.—Winze below 500 on new shoot. This has been deepened to 75 feet, and suspended. The winze having entered the slide, the ground had become very heavy and dangerous for sinking. A second winze has been commenced 200 feet north of this, and the ground between will now be opened from the latter. Lode in bottom 1 foot wide, assaying 6 dwts. 6 grains of gold per ton.—Rise back 440 west of dyke. Risen by hand labour 4 feet, total 140 feet. This being sufficiently high to meet the 320 feet level, rising has been stopped pending communication with the 320 north of shaft.—320 north of shaft. A crosscut is being driven north-east from this level, on the crosscourse, but has not yet reached the lode. Drivage for fortnight 6 feet, total 23 feet from main drift. 320 north of rise, on new shoot, driven 13 feet, total 185. End is still in country rock, and hard for driving. 320 south of rise, on new shoot, driven 35 feet, total 162 feet from rise. Lode 3 to 4 feet wide, of quartz throughout, assaying 10 dwts. 12 grains of gold per ton.—200 north on new shoot. The drift north-east from former level has been advanced 20 feet, total 67 feet. A few branches have been passed through, but there is no quartz in present end. 200 south of crosscut, on new shoot, driven 14 feet, total 59 feet. Lode 1 foot wide, assaying 4 dwts. of gold per ton. 200 south of crosscut, west of dyke, driven 6 feet, total 22 feet. Lode is 6 feet wide, of mixed character, and average assay is 5 dwts. of gold per ton. Rise back 200 north risen 18 feet, total 59 feet 6 inches. Communication with shaft not yet effected. New east shaft sunk 5 feet, total 125 feet. Progress hindered by timbering and a fall of ground. At the 200 we have placed a gang to crosscut through the lode at the point of fold. After driving 6 feet they reached the hanging-wall, and a drift is now being carried forward on this part of the lode, which is worth 1 ounce 5 dwts. of gold per ton.—Trial shaft. The 100 feet level south has been driven during the fortnight 32 feet, total 132 feet. There are branches of lode matter all over the end, but these yield only a trace of gold in the assay.

**GOLD FIELDS OF MYSORE.**—Mine report for the fortnight ending September 10:—Oriental lode, south shaft. The 230 feet level end north of crosscut on West Balaghat lode has been driven 13 feet, total 68 feet 6 inches. The lode is 4 feet wide. There is no change to note in its appearance from that last reported. Its assay value is now 1 dwts. 3 grains of gold per ton. The end driving south at this level has been driven 13 feet 6 inches, total 74 feet. The lode is 4 feet wide, chiefly of black rock with a little quartz and arsenical pyrites scattered throughout, assaying 2 dwts. 7 grains of gold per ton.—Oriental lode, rise stopes over the 280 feet level south of shaft. The lode is 8 feet wide, and is composed of about equal parts of black rock and quartz, assaying 4 dwts. 13 grains of gold per ton. This rise is being put up to open out stoning ground, and we hope to get into richer ground higher up. Stripping down side of north level, finding a body of mixed rock standing in the east side we commenced to blast it down, and find it about 6 feet thick, assaying 10 dwts. 5 grains of gold to the ton.—The 380 feet level north. We have commenced a rise from this level to effect communication with the middle shaft, risen 3 feet. The lode formation is about 4 feet wide, but does not carry any quartz, and is of no value.—Rise for stopes over this level 150 feet north of shaft. Lode 4 feet wide, assaying 2 dwts. 7 grains of gold per ton: risen 12 feet. Rise for stopes over the south level 190 feet from shaft: risen 12 feet. Lode 6 feet wide, assaying 5 dwts. 8 grains of gold per ton. The water is being drawn out from the 470 feet level, and within four days we shall have it drained, when we shall resume operations there.

**HARMONY GOLD.**—In a letter dated the 6th ult., the local secretary at Pietersburg, in the absence of the general manager, writes as follows: Sterkloof. Everything is progressing favourably on this farm. The fencing, with the exception of the lacing of the wires, is now completed. The large dam in course of construction at the foot of the fountain will be completed in good time for the rainy season, and should give us more than sufficient water for all purposes during the winter. The new road, which is a short and direct road to the centre of the town, is now ready for traffic, and a great number of wagons have taken advantage of the short cut already. This new road will greatly enhance the value of the erven to be laid out on the farm, as, previous to it being made, one had to make a circuit of over a mile before reaching the homestead, whereas now the distance is only about 200 yards. All the fruit trees and vine cuttings planted some two months ago are thriving splendidly, and should give a good return next season.

**KEMPINKOTE.**—Mine agent's fortnightly report dated September 9: Garland's shaft has been sunk 11 feet 3 inches, total depth from surface 418 feet. The bottom of the shaft is still in lode assaying 1 dwts. of gold per ton. 345 north drive has been driven 27 feet 6 inches, total distance from main crosscut 94 feet 6 inches. The end is in schist. 345 south drive has been driven 31 feet 6 inches, total distance from main crosscut 103 feet 6 inches. We have passed through about 4 feet of schist, the end is in solid lode, assaying 2 dwts. 3 grains of gold per ton.—245 No. 2 winze. In the bottom

No. 1 crosscut 50 west of footwall has been sunk 7 feet 6 inches, total depth 7 feet 6 inches. The lode in the bottom is the full size of the winze, giving an average assay of 8 dwts. 10 grains of gold per ton. There is a seam in it about 8 inches wide, showing visible gold. It has assayed as high as 1 ounce 6 dwts. of gold per ton. 245 south drive has been driven 21 feet 3 inches, total distance from main crosscut 335 feet 9 inches. Lode in the end 3 feet wide, assaying 3 dwts. 20 grains of gold per ton.—245 No. 2 crosscut west, 280 feet south of main crosscut has been driven 12 feet 6 inches, total distance from footwall 18 feet 6 inches. The lode is about 14 feet wide, assaying 18 grains of gold per ton. The end is in schist.—Henty's shaft. During the past fortnight our sink coolies have been engaged in enlarging the shaft at the 341 level.—341 north drive has been driven 6 feet 9 inches, total distance from shaft 13 feet 6 inches. About 10 feet north of shaft we have started to crosscut both east and west. The east crosscut has been driven 6 feet and the west crosscut has been driven 6 feet. The ground in these ends is hard schist.—258 No. 1 crosscut west, 208 feet south of main crosscut has been driven 6 feet 6 inches, total distance from side of level 16 feet 16 inches. Lode in the end full size of the drive, assaying 4 dwts. of gold per ton.—173 crosscut west, 100 north of shaft has been driven 7 feet, total distance 25 feet 9 inches. The end is in schist.

**KINSELA.**—Mine manager's report for fortnight ending August 22: Mill. The motor boxes are fixed and screwed down, and I hope by the end of the week the framework will be completed, and cam shaft, heads and shanks in position. Tramway between the main shaft and mill is being constructed, and erection generally pushed on as fast as possible as the machinery arrives.—Mine. Opening up the lode at water level is being pushed forward with a view of grasping the alternate value, angle of dip, and other peculiarities, and by the end of the month hope to have about 700 feet of lode exploited and connected to the main shaft. During the week we have opened up some good battery staves; for particulars you will please find the foreman's report herewith attached. The value of the ore I have not checked, but there has been no difficulty in seeing gold freely at times, testing the quality of the ore, as we open it up will be taken in hand after the mill commences work.—Foreman's report. I have the honor to report that during the past fortnight we have continued driving on the lode. At the main shaft the drive south has been extended 31 feet, making total distance driven 87 feet. As stated in my last report, the lode was pinching out, and has continued to do so all this fortnight. There is only about 1 foot of stone in face of drive at present, and this is of very poor quality, and has been put by itself. No. 1 shaft south the drive north has been extended 10 feet, making total distance driven 64 feet. The lode here is only about 1 foot wide, and very poor in gold. There is now about 52 feet between end of this drive and the drive coming south from main shaft. I think there is very little stone in this 52 feet, but think it would be wise to continue the drive, as it would give us a roadway from main shaft to No. 1, 2, and 3 south shafts. The south drive from No. 1 south shaft has been extended 22 feet, total from shaft 71 feet. Lode about 4 feet wide, showing fair gold, but mostly in footwall slab, the headwall slab being poorer. No. 2 shaft south. Two men have been taken out of north drive, No. 1 south shaft, and put into this shaft, and a start made to drive north to meet south drive from No. 1 shaft. 7 feet has been driven on very nice stone, showing gold freely; I should think equal to 2 ounces to the ton. It is evident there is a good shoot of stone here of over 200 feet in length, with an average of about 5 feet of stone; there now remains about 34 feet to drive to connect Nos. 1 and 2 shafts south. Nos. 2 and 3 are already connected.—No. 1 north. The drive has been extended 24 feet, making total distance 68 feet north of shaft. Lode 6½ feet wide, showing fair gold. In my last report I omitted to state that a body of stone had gone into the headwall side of lode. I broke some of the stone, and could see fine gold through it; this is 15 feet from shaft, and at some future time it would be wise to crosscut into it and see what it is. The total distance driven for the fortnight is 94 feet. We have broken and hauled to the surface about 180 tons of stone.

**MOUNT LYELL.**—Copy of mine manager's report for week ending August 14:—Surface prospecting shaft, hanging wall. The shaft has been sunk a further depth of 8 feet, total 97 feet, sinking in schist and ironstone.—No. 2 crosscut north drive No. 3 tunnel. The crosscut has been driven 1 foot, total 24 feet; pyrites intensely hard, and difficult to break.—South drive No. 3 tunnel. The face has been driven 10 feet, total 423 feet. The country has been easier for working.—North drive, Indicator winze. Seven feet has been driven, total 74 feet. There is a band of very hard rock next the pyrites.—North drive No. 4 tunnel. The contractors have driven 2 feet, total 189 feet 6 inches. There is no change to report.—South drive No. 4 tunnel.—The drive has been advanced 12 feet, total 222 feet. Some very good ore has been seen along the pyrites wall.—No. 2 winze south drive 50 feet level, engine shaft No. 4 tunnel. The winze has been sunk 3 feet, total 27 feet. The pyrites are getting much harder.—South drive 75 feet level. This drive has been advanced 10 feet along the pyrites wall.—No. 5 tunnel. The contractors have driven 7 feet 6 inches, total 1080 feet. The hard country has given place to schist rock. Progress report for week ending August 16:—Haulage line. Patslaying completed to bank engine shed, and ballasting in full progress. Fixing tracks in bank engine station yard, and laying mine cable. Everything working very smoothly and well.—Smelter site. Remaining walls and main flue making good progress. Foundations for smelter stack in progress, and carpenters engaged framing ready for erect on directly brick walls sufficiently advanced.—Converter site. Excavation and clearing enlarged to full size, and active progress being made. Smelter siding in desultory progress, as opportunities occur for use of loco.—Brick plant. Additions and alterations being actively pushed on, and will all be completed shortly. Running full time with old plant. New sawmill shed completed, and bed logs ready. Contractor making good progress with his wooden tram for getting logs. Weather beautifully fine.

**MILLS' DAY DAWN UNITED.**—Mine manager's report for the fortnight ending September 30: Underlie shaft sunk further 6 feet, total 132 feet below 9 plat, and timbered up. Laying permanent road. 9 level east driven 6 feet, total from plat 34 feet. 9 level west H. W. driven 16 feet, total from plat 318 feet. 18 inches fair stone in face, which has improved. Stopes 12 to 24 inches, medium quality. F. W. drive extended 13 feet, total 75 feet. 18 inches heavy mineral stone in face, with leaders through formation. Total, 3 feet crushing stuff. Stopes 18 inches, good quality. Intermediate drive driven 24 feet. Passed through small leader. May meet reef at any time. 8 level west stopes 2 feet 6 inches, good stone. Crosscourse winze sunk to total of 60 feet, or 18 inches good stone. 6 level east and west, stopes over, average 2 feet 6 inches, very good stone. F. W. stopes reef 2 feet, medium quality.

**MOSMAN.**—Mine manager's report for fortnight ending August 17:—North Australian shaft, Byerley level north. Reef in four stopes averages 5 inches, fairly good quality. Byerley level south. Reef in four stopes average from 2 to 15 inches, and varies in quality from very poor to 2½ ounces per ton.—Paddy shaft. Shaft deepened 30 feet, total depth from surface 278 feet. No. 1 south level extended 8 feet, total from shaft 28 feet, reef 6 inches, mineral stone.—Wyndham shaft. Shaft sunk 6 feet, total below 14 level 62 feet, reef on south side 8 inches, fairly mineralised, 14 level south driven 9 feet, total length 159 feet, heavy water. 13 level north driven 16 feet, total length 428 feet, reef 18 inches, very white, formation good for gold. 8 level south. Stopes, reef 2 to 15 inches, say 25 dwts.

**MURCHISON UNITED.**—The mines manager reports from One under date August 26, that during the month ended July 31 the following work has been done, viz.:—Drive north from vertical shaft at water level 37 feet, making a total of 106 feet; crosscut from this level 6 feet; drive from crosscut in hanging wall on vein 10 feet.—Drive south from A shaft 9 feet, making 69 feet. Stope south from A shaft 10 feet by 14 feet about 10 tons of good quartz has been raised. A cable was received on September 28 that he will commence to erect the machinery during the present month, the boiler being already loaded for transport by rail.



**WENTWORTH EXTENSION.** — Report dated August 24:—  
Main shaft: Carroll's No. 2 sunk 11 feet during week; total depth,  
130 feet. Without change.

SEPTEMBER, 1895.

(From Messrs Henry R. Merton and Co's Circular for September, 1895).

### COMPARATIVE STATEMENT.

\* Including Chilean and North Americans for all Europe.

(From Messrs. A. Strauss and Co.'s Circular for September, 1895).

Shipments during the month from Straits to London ... .. 2,550 Tons

**Banca is Trading Company's hands and effort, 5447 tons.**

English Common Ingots	...	...	...	88 0 0 refined	...	...	7 0 0
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